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Carbohydrates

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Carbohydrates

Sugars and Starches

As a person interested in nutrition, it may have been your displeasure to have to listen to the sweet propaganda song promoting sugar as an energizer, at almost any old time of day, but especially at a certain mealtime.

A 1970 estimate of the per capita use of "foodless food" totaled 276 pounds in comparison with the consumption of important nutritional foods, which totaled only 259 pounds per person. And in reference to the above song, sugar accounted for an amount in excess of 100 pounds per person of the estimated 276 pounds. When we consider that starch is also assimilated as sugar (glucose), we must realize that the so-called natural dietary balance of carbohydrates, fats, proteins, minerals, and vitamins is top-heavy with refined carbohydrates, the least desirable, because they are high in heat units (calories) and low in or void of the essential nutrients we must have for good health.

It has been conclusively established that the circulating blood cannot supply sugar needed in the oxidative process for heat production in excess of one-tenth of one percent of the total volume of the blood. The healthy pancreas sets up a barrier to maintain this small percentage. However, when we continually cram ourselves with "sweets" in an excess never before consumed by any other nation, we are overloading the pancreas so that it becomes necessary for the kidneys, liver, lungs, skin, and other glands to dispose of the excess fuel. With such overwork, it is only a matter of time before one or more of these glands completely breaks down.

Scientists now know that it is the refined carbohydrates that are at fault. Over ten years ago the late Norman Jolliffe, MD, a leading nutritionist, named refined sugar and highly processed cereals as prize examples of "empty calorie foods," completely deprived, or nearly so, of their natural quota of vitamins and minerals. The tasty, over-sugared dry cereals furnish little more than the advertised "snap, crackle and pop."

As stated before a Congressional committee recently, it was the milk used in conjunction with these cereals that seemed to furnish most of the nutrition. You may recall that it was Dr. D. Mark Hegsted, a conservative Harvard University nutritionist, who criticized refined "empty calorie" foods by innovating the expression "junk foods." He further stated: "It's easier to choose a bad diet today than it was fifty years ago."

History reveals that from the beginning of time humans lived without the use of sugar as a special food. It was naturally provided in honey, fruits, vegetables, sorghum grasses, grains, and sweet sap such as maple syrup. The supply from these sources was self-limiting, as it would take three or four apples or a one-pound sugar beet to furnish approximately one to two teaspoons of sugar.

Now, Dr. Herman Beck, of the University of California Dental School staff, notes our daily exposure as follows: 5 teaspoons of sugar in an 8 oz. bottle of soda pop, 6 teaspoons to every sugar-glazed doughnut, 10 teaspoons in a piece of chocolate cake, 13 teaspoons in a piece of raisin pie, and (surprise) a half teaspoon in a single stick of chewing gum. And (surprise) a half teaspoon in a single stick of chewing gum.

It is only since man has refined beet and cane sugar to a "pure" state and whiteness that the resulting chemical product known as sucrose has become available in large quantities and at such a low cost that it plays a prominent part in our everyday living. As a result, our present excessive use is said to contribute to many degenerative diseases. Scientists have classified it with alcohol, coffee, tea, chocolate, cola drinks, and tobacco as being habit-forming. Sucrose as a fuel burned in the tissues supplies *only heat*, as it has been so "purified" that it cannot furnish any of the mineral salts, vitamins, biochemical reactions, or the maintenance and body-building materials so indispensable to health. The end products of the combustion of refined carbohydrates are acid and usually contribute to the depletion of our mineral salt reserve.

Other Sugars

Other dietary sugars are levulose (or fruit sugar, also called fructose), lactose (or milk sugar), maltose (or malt sugar), and corn sugar (a synthetic product made by the hydrolyzation of corn starch). Commercially, corn sugar can be variously known as dextrose, corn syrup, invert sugar, or dextroglucose. In the body all of these sugars, regardless of name, are broken down into the simple sugar glucose. At one time the Sugar Information Foundation, Inc., claimed that because one of the end products of sucrose is glucose, a normal blood constituent and necessary to life, sucrose must be a good energy food. They overlooked the fact that other sugars and starch are also metabolized as glucose, possibly making the concentrated sucrose excessive.

Research by the late Dr. E.M. Abrahamson, Dr. S.E. Roberts, and others who at one time regarded the refined carbohydrates as energy foods, disclosed that they actually rob the body of energy. It is true that a quick lift is obtained by eating concentrated sugars; however, the blood sugar level is raised only for a short time and then drops like a plummet. Tests have shown that four ounces of glucose is all absorbed in the bloodstream fifteen minutes after ingestion, but four ounces of levulose from raw honey requires four hours. From this it seems obvious that for sustained energy the blood sugar level must be supported by natural sugar, proteins, and unrefined carbohydrates.

The bad effect of these concentrated carbohydrates on teeth has been known for years, but the inadequacy in general nutrition and the injurious effects on overall health is a more recent finding. They specifically do not supply the minerals calcium, phosphorus, potassium, and magnesium so necessary in tooth and bone formation, and they further antagonize by inhibiting the assimilation of calcium systemically. Refined carbohydrates, particularly the concentrated sugars, apparently interfere with proper metabolism, whereas natural sugars accompanied by the other food elements with which nature endowed them seem to aid metabolism.

Synthetic Glucose

In estimating the tonnage or per capita consumption, usually only the refined or white sugar is considered. However, with the vast consumption of other sugars, starch, and corn syrup it would appear that the 102 pounds per capita is just the visible part of the iceberg of sugar consumption.

The part submerged in other products is at least 50 percent more. For instance, we have corn syrup (a synthetic glucose), which is made by denaturing corn starch by the process of cocking it with sulfuric or hydrochloric acid. It is often listed on product labels as dextrose, dextroglucose, or starch sugar.

Corn syrup appears to be a versatile product in food preparation. For instance, it is found on the labels of sausage meat packages. Its purpose here, we are told, is that as a sugar syrup it serves as a penetrating carrier for sodium nitrate and sodium nitrite. Otherwise, some 80 percent of this synthetic glucose is sold to bakers, confectioners, jam and jelly makers, and the manufacturers of many other foods and beverages.

With some carbohydrate bakery foods, the loss of minerals and vitamins is quite extensive. Some have been lost in the bleached white flour, white sugar, confectioner's sugar, corn syrup, highly heated milk powder, egg powder, and the pasteurized eggs reserved for use in special products.

Carbohydrate Metabolism and Diabetes

In 1910, Dr. H.A. Wiley, the first director of what is now the FDA [and author of *The History of a Crime Against the Food Law*], predicted that corn syrup or, as he called it, a synthetic counterfeit food component, would cause diabetes. But it was not until 1942 that Drs. Lukens and Dohan, scientists at the University of Pennsylvania, proved that it did influence the trend of the diabetic syndrome in test animals. In fact, they found it was the only sugar that would cause diabetes in test animals.

Clinical investigators have accumulated evidence that the excessive ingestion of refined sugars and starches, now so common in the diet of our American people, apparently accounts for the rapid increase of diabetes and other diseases, and at an increasingly younger age. In diabetes the pancreas loses its effect as a sentinel because it is subjected to such acute strains by short episodes of massive sugar consumption that it is no longer able to

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manufacture the necessary insulin.

Therefore, hyperglycemia is caused by the introduction of more sugar than the body can use or convert. Even though the insulin controls the condition, to some extent, fat continues to migrate to the liver and hamper its action in cholesterol regulation. The higher cholesterol level in diabetics and their susceptibility to coronary conditions and impaired circulation to the extremities is well recorded. Then too, the fat migration has contributed to fatty degeneration of the liver, often with a fatal ending.

In early experiments with depancreatized dogs, scientists discovered that insulin injections controlled hyperglycemia better if the dogs were fed raw pancreas. In the 1930s, Dr. Lester R. Dragstedt, now a professor of research surgery at the University of Florida in Gainesville, succeeded in extracting a strongly lipotropic material from fresh pancreas. He called it "lipocaic." It was at the time when choline became popular as a fat metabolizer, so lipocaic was forgotten.

After many experiments with dogs and in clinical studies, the late Dr. Michael Somogyi, former head of the biochemistry department at the Jewish Hospital in St. Louis, revived the use of raw pancreas in diabetes. He maintained that a lipocaic deficiency can play a decisive role in bringing on diabetes. Also, that it is "as indispensable for the sustenance of life as insulin." He found that "insulin was obviously present during the diabetic state, but its action was blunted by faulty fat metabolism." Dr. Somogyi determined that with the administration of lipocaic, in the form of pancreatin, to patients with an impaired glucose tolerance, the fat tolerance was also improved, and in some cases restored to normal. It is quite apparent from these experiments that carbohydrate metabolism and fat metabolism are intimately concerned with each other.

The Carbohydrate and Fat Metabolism Problem

The trend to a low-fat diet and higher carbohydrate diet is believed to contribute to other disorders incident to lowered resistance, such as deficiency anemia, acidosis, intestinal stasis, constipation, tuberculosis, and according to more recent research, heart and vascular diseases and hypoglycemia (low blood sugar). The present popular denatured carbohydrate diet is now known to create new metabolic problems that may possibly interfere with heart action and also raise the cholesterol and triglyceride levels in a manner similar to that previously believed caused by the ingestion of saturated animal fats. Apparently, this former tenet was erroneous, as it has now been conceded that oils when hydrogenated become unassimilable saturated fats and must be more detrimental than the assimilable natural animal fats.

Denatured foods must necessarily cheat on furnishing the natural metabolizers. For instance, both hydrogenated fats and synthetic glucose inhibit calcium assimilation. It has been proved that a natural sugar like lactose and a natural animal fat like arachidonic acid stimulate calcium assimilation. Modern advertising to the contrary, Mother Nature refuses to be fooled by clever advertising gimmicks. This reversal of the normal activity is commonly found with synthetic vitamins and hormones and is also true to a certain extent with some of the synthetic amino acids.

The hydrogenated fats and/or denatured carbohydrates are usually found as common factors in the high cholesterol levels of syndromes such as biliary obstructions, pancreatic and hepatic disease, cardiovascular diseases, uncontrolled diabetes, eclampsia, hypertension, lupus erythematosus, nephritis, nephrosis, and other less common ones. It seems very probable that high cholesterol is not the cause but a result of metabolic failure due to various causes, some of which are not yet even suspected.

According to a study by H.A. Kahn reported in the *American Journal of Clinical Nutrition*, 23:879, 1970, covering the period from 1909 to 1965, the causal relationship between dietary cholesterol and fat and the incidence of heart disease was not borne out. In fact, changes in serum cholesterol associated with changes in dietary fat in the past fifty to sixty years in this country have not been very great. Kahn concluded:

> "This in turn indicates that the increased risk of coronary heart disease reported to have occurred over this period is not related to dietary fat changes to a very important degree. Changes in fat consumption may well be a means of lowering present day risk of coronary disease but other environmental factors are more probably associated with having raised the risk from that of fifty years ago to the present level."

As a result of his clinical investigation of coronary thrombosis and atherosclerosis, Dr. John Yukin, professor of nutrition at the University of London, contends that the increased fat consumption often blamed for the rise in coronary disease is only indirectly responsible, whereas there is a direct relationship to increased sugar consumption. He said: "Sugar causes changes in the lipids in the adipose tissue, in the liver and in the plasma." Also: "The relationship of heart disease with dietary fat is accidental. It comes about because the intake of fat and sugar are parallel, even in different countries."

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In *Science News*, December 30, 1967, a report that fat-free or low-calorie diets make artery-clogging worse and increase the threat of atherosclerosis. Drs. Martyn Bailey and Jean Butler, two George Washington University physicians, observed that this type of diet forces the body to draw on its fat reserves but does not cause atherosclerotic deposits to break up. The report said, "Part of the stored fat released into the blood may actually be deposited in the arteries." So, diet in obesity becomes a problem.

Saccharine Conditions

From *The Saccharine Disease* [see *Applied Trophology*, Vol. 11, Nos. 6 and 7 for Part I and Part II], by Cleave and Campbell, we learn that "saccharine" means sugar-related. They specify the related diseases as coronary thrombosis, dental caries, constipation, diabetes, obesity, peptic ulcer, varicose veins, and certain infections with coliform bacilli, particularly Escherichia coli. The intestinal organisms concerned are those that especially feed on sugar. If sufficiently numerous they may perforate the mucous membrane wall itself, especially so in sac or pouch areas such as the appendix or gallbladder, and cause an acute peritonitis. After passing into the bloodstream the organism may cause pyelitis during its excretion by the kidney. The fact that sugar is used in making bacterial cultures is an indication that it favors the growth of bacterial organisms.

Refined white sugar, even though without minerals and vitamins, did not have the same tendency to cause diabetes that synthetic glucose did in the Lukens and Dohan test. In another test the importance of the vitamins and minerals in unrefined sugar was emphasized when test animals died in a few days on white sugar and dried hamburger, whereas the control animals seemed to get along well, for indefinite periods, on unrefined sugar plus the same dried hamburger.

Dr. John Yudkin appraises this effect on animals on a sucrose diet to a less efficient metabolism. The principal mineral element in unrefined sugar, molasses, or sorghum is potassium. Potassium deficiency promotes heart failure and even necrosis, according to Samuel Soskin, MD, in *Progress in Clinical Endocrinology*, Grune and Stratton, p. 279. Normally, potassium is found chiefly in the intracellular fluid. Insulin action creates a demand for potassium.

The normal person has a steady secretion of insulin, but the diabetic person tends to develop acidosis, which may cause diabetic coma, a condition usually related to potassium deficiency and a need for more insulin. Following insulin administration, symptoms of potassium deficiency were noted by Dr. Soskin as follows: "Shallow and rapid breathing, restlessness, disorientation, muscular weakness, high venous pressure and paralysis."

If the coma is attributed to the high blood fat and cholesterol that occurs parallel to the high sugar, some researchers consider cholesterol estimation to be a better index of the severity of diabetes than the estimation of sugar in the blood. The high blood cholesterol of the diabetic predisposes him to cardiovascular disease and arteriosclerosis. Diabetic retinitis and diabetic gangrene may also result.

Other important minerals, besides potassium, refined out of white sugar are calcium, phosphorus, and magnesium. We have previously outlined the importance of calcium and phosphorus in fat metabolism. Dr. E.V. McCollum, a pioneer nutritionist and author of *The Newer Knowledge of Nutrition*, determined with animal tests the need for magnesium to combat cholesterol formation. Clinicians have since found the need for magnesium in humans is also increased if cholesterol is high. The presence of magnesium in the diet has, in some instances, apparently prevented atherosclerosis.

Years ago, Daniel T. Quigley, MD, reported that he found it impossible to treat any cancer patient successfully until he had eliminated all glucose from the diet. This seems to tie in with later investigators' use of small doses of insulin in combatting cancer. Also, investigators in Germany have shown that glucose injections can cause cancer at the site of the injection.

Modern investigative facts and recent clinical results refute many of the preconceived medical dietary concepts. This is the reason that the theory of cholesterol as a primary cause of atherosclerosis and some other conditions has not been universally accepted. Usually, the loss of one or more metabolizing factors by processing or denaturing foods has not been considered, neither has the role that cholesterol actually plays in the metabolic processes of man.

Forgotten is the fact that cholesterol is the precursor of the necessary steroid hormones, forms a part of the membrane surrounding every cell in the body, and among other duties aids in forming the protective fatty layer around the nerves, apparently to protect them from shock. One of the characteristics of malnutrition is extreme irritability. It has long been suspected that this is probably due to the loss or depletion of cushioning fat around the nerves. The production of fat for nerve insulation is a special metabolic entity and in no way concerned with residual body fat.

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Obesity

The fact that all living matter, including the human subject, stores excess sugar and starch as fat has been known for a long time. When this excess resides or accumulates in extreme amounts the subject is said to be corpulent, obese, or just plain fat. Diets high in sugar and starch tend to promote the formation of residual body fat and obesity. Obesity has now become a national problem. More and younger children are becoming obese as they are unable to maintain nutritional health due to the "empty calorie" foods they overconsume as a result of the "hidden hunger" of malnutrition. Science now considers obesity a form of malnutrition.

In the early days of man, food, and nutrition were almost synonymous. His food was little altered from the way nature produced it. As a contrast food on the market today has been denatured by fragmentation, chemicalized with additives, bleached, artificially colored, flavored to appeal to the taste buds, and fortified or enriched by the addition of some synthetic vitamins or inorganic minerals. Dr. Royal Lee described this later maneuver of "depriving flour of more than twenty natural nutrients and replacing them with five or six synthetic vitamins," as similar to "a robber taking your purse containing fifty dollars and under protest giving you back fifty cents in counterfeit for car fare."

Originally these lost fragments from flour milling ended up in cattle food as bran, middlings, shorts, etc. Now they are being sold back to the consumer as bran, wheat germ, or wheat germ oil at exorbitant prices. Unbalanced foods are fattening, so we now have a rash of reducing diets, none of which seems to accomplish its purpose.

Back in the 1960s Walter C. Alvarez, MD, a specialist in internal medicine, offered this advice: "The great secret in reducing is to eat much less starch, fat and sugar and more salads, vegetables and fruit."

And the late Dr. William R.P. Emerson, then Medical Director of Aetna Life Insurance Company, presented this advice (emphasis ours): "The correction of faulty health habits is of more value than any life insurance policy, however large. *If the food you eat lacks the vital elements your body needs you will lack the vitality you need*. We must be more concerned with the nutritional *quality* of our food by being sure it is high in proteins, minerals and vitamins and low in refined sugars and starches, a balanced saturated and unsaturated fat entity and a moderate salt intake." On another occasion, he advised: "Omit all non-vitamin foods."

Further, Dr. Frederick Kilander, former professor of health and education at New York University, said:

> "Housewives make their choices on the basis of food preference first, and only secondly on nutritional value. Using taste to guide them they are coming home with more sweets, high starch and other high calorie foods, the same foods responsible for the American overweight problem with its resultant diseases. Food-buying habits will only be changed by teaching nutrition in the junior and senior high schools. Schools must begin to teach that people do not necessarily know and like the foods that are good for them."

Apparently, we must first teach the teachers. In this regard it is encouraging to note that the University of Kentucky is establishing a special nutritional course which will be mandatory for all physical education majors. We sincerely hope that these teachers are taught that "good taste often cheats the bloodstream." Or, as London nutritionist Dr. John Yudkin has said it: "Man is increasingly exposed to foods of high palatability but of low or undesirable nutritional value."

It is regrettable that many dental and medical "doctors," in order to cope with child patient behavior problems, ply them with suckers or soda pop, both of which are a detriment to dental and general health. Good health demands more of the "vital foods" and much less of the "foodless foods." The "hidden hunger" of malnutrition certainly is associated with obesity. For, as Dr. Robert Jackson recently stated, "Only natural foods can build a natural body."

Cholesterolophobia

Heart and vascular diseases are apparently a result of modern times, conditions and dietary changes. According to medical literature, they have become prevalent during the last century, and it has only been during the last fifty years that investigators have linked serum cholesterol with heart disease. It is doubtful if earlier physicians could have ignored the striking symptoms now present, so we must presume that coronary conditions were not very prevalent. The increasing incidence of heart disease, every year, closely parallels the increasing consumption of sugar and, according to recent research, is not believed to be similarly linked with the consumption of animal fat (saturated) or of total fat.

Many physicians erroneously assumed a causal relationship between dietary cholesterol and serum cholesterol. Some became fanatical about the avoidance of cholesterol-containing foods. Even though a direct relationship between dietary cholesterol and heart disease had never been proved, they were imbued with the idea that modifying the diet to reduce or eliminate the consumption of eggs, dairy products, and animal fats was the complete answer.

Now, cholesterolophobia is so much in evidence, in some homes, that eggs in toto, or at least the yolks, have been banned from the diet. Mothers are afraid to serve their children whole milk and butter is never on the table. We presume they have been advised that "the holy value of milk should be de-emphasized."

In May of this year, the American Heart Association (AHA), an ardent proponent of reducing dietary cholesterol, slightly modified its position by identifying other risk factors, including hypercholesterolemia, hypertension, cigarette smoking, diabetes, and habitual lack of exercise. They now recommend a fat ratio of equal parts of polyunsaturated, monounsaturated, and saturated fats.

Dr. Campbell Moses, AHA's medical director, admitted to the misunderstanding and confusion about the role of dietary fat and cholesterol in the development of atherosclerosis. No doubt some of this confusion has been a disservice to the public and resulted in malnutrition, in some instances of fanatical avoidance of cholesterol-containing foods. Sweet songs and sweet advertising tend to lure children from eating bodybuilding food to make them healthy.

Food processors continue to make foods cheaper and of less nutritional value by the addition of more and more sucrose and this, according to Dr. John Yudkin, University of London nutritionist, "without a doubt contributes to so much disease and death."

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